

SIMULTANEOUS OCCURRENCES AND FALSE-POSITIVES ANALYSIS IN DISCRETE EVENT DYNAMIC SYSTEMS

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Abstract

Simultaneous occurrences of events have been a crucial and hard problem since the beginning of the research about automaton and simulation theories of discrete event systems, for more than 50 years. This article addresses some diagnosis problems in industrial processes, situations such as simultaneity of events, false positives, and partial recognition of event sequences. V-nets are presented as a means to model dynamic processes without the state machine concept and, the robustness and capability to identify different sequences of discrete events. With the V-nets formalism, it is possible to identify the evolution of the discrete events, simultaneous occurrences of events, partial recognition, counting the number of times that each discrete event occurred in a temporal sequence and this formalism also has the capability to model sequences of sequences. An example of one industrial application is presented and a comparative analysis of the Time Petri Nets, Timed Automata, and Chronicles with the V-nets is exposed.

Keywords

Simultaneous analysis, V-nets, False positives results, Discrete time systems, Diagnosis, Chronicles